Jan. 15, 1952 D. C. LUCHT 2,582,444

CAM ACTUATED SLIDABLE JAW WRENCH

Filed Nov. 25, 1949

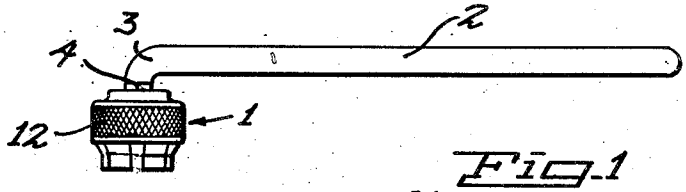

Fig. 1

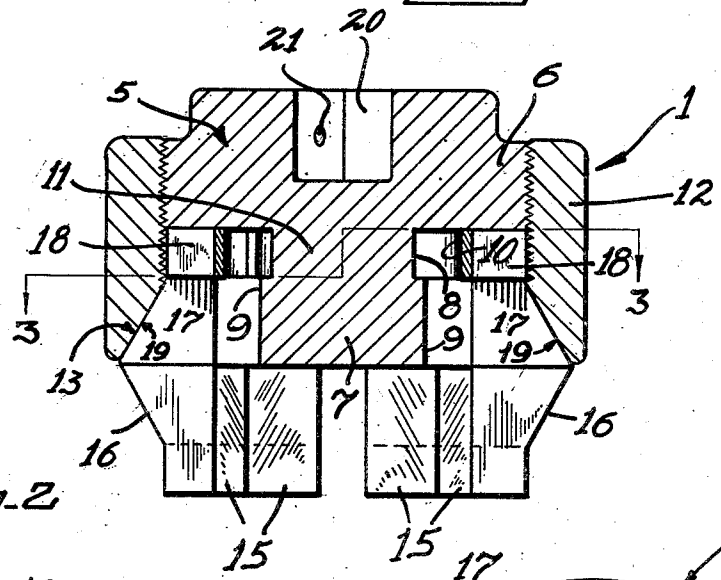

Fig. 2

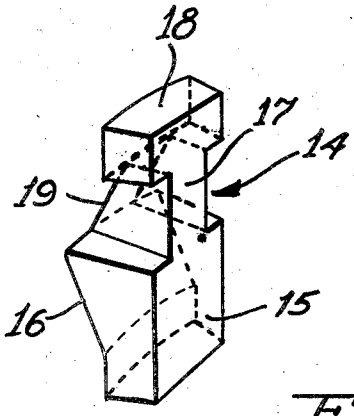

Fig. 4

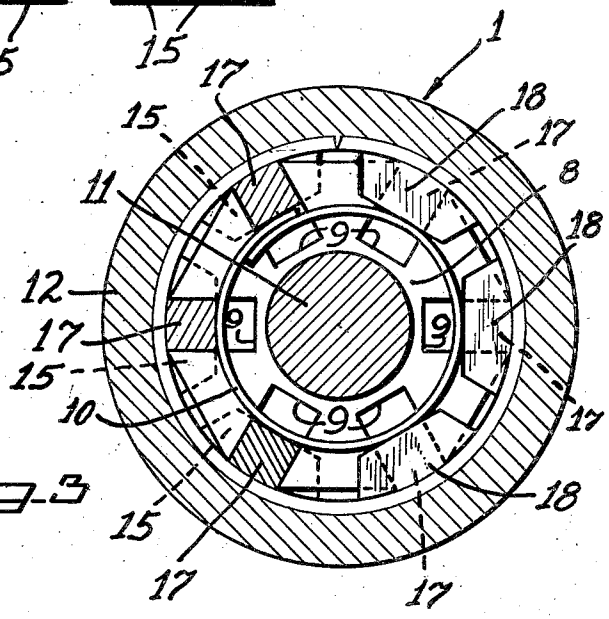

Fig. 3

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Patented Jan. 15, 1952

2,582,444

UNITED STATES PATENT OFFICE

2,582,444

CAM ACTUATED SLIDABLE JAW WRENCH

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Application November 25, 1949, Serial No. 129,465

3 Claims. (Cl. 81—128)

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This invention relates to a wrench and it is one object of the invention to provide a wrench having a head adapted for detachable engagement by a handle and provided with nut-engaging jaws which are of such construction that they may be moved into and out of position for gripping a nut to be turned.

Another object of the invention is to provide the head with jaws which are urged towards a releasing position and have cam faces engaged by cam faces of a collar carried by the head and having threaded engagement therewith so that by turning the collar it may be advanced towards the jaws and force them to a gripping position.

Another object of the invention is to provide the wrench with jaws so mounted that by unscrewing the collar from the head the jaws may be entirely released and removed for repairs or replacement by other jaws.

Another object of the invention is to provide a wrench which is strong and not liable to be broken when in use.

The invention is illustrated in the accompanying drawings wherein:

Fig. 1 is a side elevation of the improved wrench.

Fig. 2 is a sectional view upon an enlarged scale taken diametrically through the head of the wrench.

Fig. 3 is a transverse sectional view taken along the line 3—3 of Figure 2.

Fig. 4 is a perspective view of one of the jaws of the wrench.

This improved wrench has a head 1 and a handle 2, the handle consisting of a metal bar having its front end portion bent downwardly, as shown at 3, to form a tip 4 which is square in cross section in order to provide the tip with flat side faces. It will be understood that while the tip has been shown square in cross section it may be other shapes which will form flat side faces for the tip.

The head 1 has a body or block 5 which is formed of steel, or other hard metal, and has its upper portion 6 circular in cross section and threaded and its lower portion 7 hexagonal in cross section and of equal diameter with the upper portion. About the bottom of its upper portion the head is formed with a circumferentially extending groove 8 and its lower portion 7 is formed with slots 9 spaced from each other circumferentially of the head and extending radially thereof with their upper ends communicating with the groove 8, through the bottom

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thereof, as shown in Figures 2 and 3. A spring 10 which is formed from a strip of resilient metal, and has the shape of an open ring, fits in the annular groove 8 and is of such size that it fits loosely about the neck 11 connecting the upper and lower portions of the block or body 5 and has its overlapped end portions free from each other so that the spring may expand and contract in the groove. A collar 12 which is internally threaded is screwed upon the threaded upper portion 6 of the block and has its outer surface knurled, as shown in Figure 1, so that the collar may be firmly gripped in a person's hand and readily turned to shift it upwardly or downwardly along the body. The collar is of greater depth than the upper portion 6 of the body and has its lower portion gradually internally increased below its threads in order to form a flaring surface 13 constituting an internal cam surface for the collar.

A plurality of jaws 14, which correspond in number to the slots 9, are carried by the block or body. These jaws are of duplicate formation and each has the construction shown in Figure 4. Referring to this figure it will be seen that the jaw is formed as a unit of strong metal and is wedge-shaped in horizontal cross section. The nut-engaging lower portion 15 of the jaw has its upper portion gradually increased in thickness in an outward direction in order to form this upper portion with a vertically sloping surface 16 extending to the upper end of the said nut-engaging portion of the jaw and projecting downwardly from the collar when the jaw is applied to the block 5. Midway its width the jaw is formed with an upwardly projecting neck or shank 17 extending the full distance from the inner surface of the jaw to the upper edge of the sloping surface 16 and at the upper end of the shank is a cross head 18. The outer side face of the cross head is arcuate transversely, as shown at the right of Figure 3, so that the cross heads of the jaws may have their outer surfaces in flat contacting engagement with the internally threaded upper portion of the collar, and the outer side faces of the necks or shanks extend upwardly at an inward incline to form cam surfaces 19 which have flat face to face engagement with the internal cam surface 13 of the collar, as shown in Figure 2. Referring to this figure it will be seen that when the elements of the wrench are assembled the spring 10 urges the jaws radially of the block in an outward direction towards a releasing position, and therefore when the collar is turned

in a direction to move it upwardly upon the block the jaws will be yieldably held in the releasing position by the spring. The wrench may be applied to a nut to be tightened and when the collar is turned in a direction to shift it downwardly its cam surface 13 will act upon the cam surfaces 19 of the jaws and shift the jaws inwardly to a position in which they will have tight gripping engagement with a nut. The tip 4 of the handle may then be thrust into the socket 20 at the upper end of the block, where it will be held by a conventional spring-pressed latch ball 21, and the turning movement imparted to the head 1 until the nut has been tightened as much as desired. It will be understood that the handle will be withdrawn from the socket and shifted circumferentially of the head before being replaced in the socket for additional turning motion. If the wrench needs cleaning or the jaws or spring have to be replaced the collar is fully unscrewed from the block and the jaws and the spring may then be easily removed from the block.

Having thus described the invention, what is claimed is:

1. A wrench comprising a head having a body formed at its top with a handle-receiving socket, said body having an upper portion circular in cross section and externally threaded and a lower portion of equal diameter with the upper portion and connected therewith by a neck disposed axially of the said upper and lower portions, said lower portion being formed with radially extending slots spaced from each other circumferentially thereof, the neck being formed with a circumferentially extending groove with which upper ends of the slots communicate, jaws under said block having upwardly projecting shanks passing through the slots and being slidable therein radially of the block and carrying cross heads at their upper ends resting upon the upper surface of the said lower portion of the block at opposite sides of the slots, the shanks having outer side faces extending upwardly at an inward incline and constituting cam surfaces, a collar internally threaded from its upper end and screwed upon the threaded upper portion of the block and below the threads being flared downwardly and forming a cam surface disposed in face to face engagement with the cam surfaces of the jaws to moving the jaws inwardly towards a gripping position when the collar is turned in a direction to shift it downwardly, and a spring in said groove consisting of a ring of resilient metal having overlapped end portions, said spring engaging inner side faces of the shanks of said jaws and urging the jaws outwardly towards a releasing position.

2. In a wrench, a head comprising a block formed with a handle-receiving socket leading from its upper end and in spaced relation to its upper and lower ends being formed with a circumferentially extending groove, the block being also formed with slots in its lower portion having upper ends communicating with said groove and being open along their outer sides and at their lower ends, said block having a threaded portion above said groove, jaws each having a body portion under said block and a neck projecting upwardly and carrying a cross-head at its upper end, said jaws having their necks passing through said slots and their cross heads fitting into the groove in crossing relation to the slots, the necks having outer side portions projecting from outer sides of the slots and formed with side faces extending upwardly at an inward incline and constituting cam surfaces, a spring in said groove engaging inner surfaces of the cross heads and urging the jaws outwardly towards a releasing position, and a collar screwed upon the threaded upper portion of said block and having its lower portion formed internally with a bevelled surface extending downwardly at an outward incline and constituting a cam surface disposed in face to face engagement with the cam surfaces of the jaws and cooperating therewith to force the jaws inwardly to a gripping position when the collar is screwed downwardly upon the block.

3. In a wrench, a head comprising a block formed with a circumferentially extending groove spaced from its upper and lower ends and below said groove being formed with radially extending slots communicating with the groove, jaws projecting downwardly from said block and having necks passing upwardly through the slots and having members at their upper ends resting upon the bottom of the groove at the sides of the slots, there being cam surfaces projecting outwardly from outer sides of the slots, spring means in said groove urging said jaws outwardly towards a releasing position, a collar screwed upon said block from the upper end thereof and having a cam surface engaging the cam surfaces of the jaws for shifting the jaws inwardly to a gripping position when the collar is turned in a lowering direction, and a handle for said block.

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